Material Safety Data Sheet

In accordance with 29 CFR 1910.1200, ANSI Z400.1-2004, and ISO 11014-1: 1994.

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Product name: NatureWorks® Polylactide Resin
Product code: 4032D
Product Use: A thermoplastic coating with a variety of applications

Supplier: NatureWorks LLC
15305 Minnetonka Blvd
Minnetonka, MN 55345 USA
Customer Information Center: 800-664-6436

Emergency telephone numbers (24 hours a day): (Medical Information) (651) 632-9273
(Tranportation Information) CHEMTREC: 800-424-9300 (in the United States)
(Transportation Information) CHEMTREC: (703) 527-3887 (outside the United States)

2. HAZARDS IDENTIFICATION

Emergency Overview
CAUTION! May cause eye/skin irritation. Burning produces obnoxious and toxic fumes. Avoid contact with skin and eyes. Avoid formation of dust and aerosols

Appearance: Clear, translucent, opaque, pellets.
Physical state: Solid
Odor: Sweet

Potential health effects:

Eye contact: Contact with eyes may cause irritation.

Skin contact: Substance may cause slight skin irritation.

Ingestion: Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult the Company for Further Information.

NOTICE REGARDING MEDICAL APPLICATION RESTRICTIONS: The company does not recommend any of its products, including samples, for use: (A) in any application which is intended for any internal contact with human body fluids or body tissues (B) as a critical component in any medical device that supports or sustains human life; and (C) specifically pregnant women or in any applications designed specifically to promote or interfere with human reproduction.

Inhalation: Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough. Low hazard for usual industrial or commercial handling.

Target organ effects: There were no target organ effects noted following ingestion or dermal exposure in animal studies.

Sensitization: Did not cause sensitisation on laboratory animals

Specific hazards: No information available
Flammability: Fine dust dispersed in air may ignite.
Environmental precautions: Not determined See Section 12 for more information.

NFPA rating:
Health: 1 **Flamm:** 1 **Reactivity:** 0
Special: Not determined

HMIS classification:
Health: 1 **Flamm:** 1 **Reactivity:** 0
Personal Protective Equipment: Not determined

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name and CAS Number	Weight %	OSHA Exposure Limits:	ACGIH Exposure Limits:
Polylactide resin 9051-89-2	>98	None	None

All ingredients in quantities > 1.0% (0.1% for carcinogens) that are potentially hazardous per OSHA definitions.

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Other Standards: This material can generate Particulates Not Otherwise Classifiable (PNOC). The Occupational Safety and Health Administration (OSHA) PEL/TWA for PNOC is 15 mg/m^3 for total dust and 5 mg/m^3 for the respirable fraction. The American Conference of Governmental Industrial Hygienists (ACGIH) TLV/TWA for PNOC is 10 mg/m^3 for inhalable particulates and 3 mg/m^3 for respirable particulates.

4. FIRST AID MEASURES

Emergency telephone numbers (24 hours a day):
- **(Medical Information) (651) 632-9273**
- **(Tranportation Information) CHEMTREC: 800-424-9300 (in the United States)**
- **(Transportation Information) CHEMTREC: (703) 527-3887 (outside the United States)**

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

Skin contact: Rinse immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician. Cool skin rapidly with cold water after contact with hot polymer.

Inhalation: Move to fresh air. Call a physician immediately.

Ingestion: Drink water as a precaution. Never give anything by mouth to an unconscious person. Do not induce vomiting without medical advice. Call a physician immediately.

Notes to physician: Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability:

Autoignition temperature: 388°C

Flammability Limits in Air

Flammable limits in air - lower (%): Not determined
Flammable limits in air - upper (%): Not determined

5. FIRE FIGHTING MEASURES

Suitable extinguishing media: Foam. Water. Carbon dioxide (CO2). Dry chemical. Alcohol resistant foams are preferred if available. General-purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively.

Extinguishing media which must not be used for safety reasons: No information available

Hazardous decomposition products: Burning produces obnoxious and toxic fumes Aldehydes Carbon monoxide (CO) carbon dioxide (CO2)

Special protective equipment for firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Under fire conditions: Cool containers / tanks with spray water. Water mist may be used to cool closed containers.

Other information: Fine dust dispersed in air may ignite. Risks of ignition followed by flame propagation or secondary explosions shall be prevented by avoiding accumulation of dust, e.g. on floors and ledges.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Use personal protective equipment. See Section 8. Remove all sources of ignition. Avoid dust formation. Avoid contact with skin and eyes. Sweep up to prevent slipping hazard.

Environmental precautions: Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system.

Methods for cleaning up: Shovel into suitable container for disposal.

7. HANDLING AND STORAGE

Safe handling advice: Avoid contact with skin and eyes. Avoid dust formation. Workers should be protected from the possibility of contact with molten material during fabrication. Low hazard for usual industrial or commercial handling. Use personal protective equipment. See Section 8.

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7. HANDLING AND STORAGE

Storage:

Store in cool place. Keep at temperatures below 122F (50 °C).
No special restrictions on storage with other products

Precautions: No special precautions required

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. Provide appropriate exhaust ventilation at places where dust is formed.

Control parameters: None

PERSONAL PROTECTIVE EQUIPMENT:

Eye protection: Safety glasses with side-shields. Goggles.

Skin and body protection: Impervious clothing.

Respiratory protection: Respirator must be worn if exposed to dust. Wear respirator with dust filter. Respiratory protection is needed if any of the exposure limits in Section 3 are exceeded. Consult an industrial hygiene professional prior to respirator selection and use. Use a postive-pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Hand protection: Preventive skin protection.

Hygiene measures: Avoid contact with skin, eyes and clothing.

Exposure limits: See Section 3.

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9. PHYSICAL AND CHEMICAL PROPERTIES:

Appearance: Clear, translucent, opaque, pellets.
Physical state: Solid
Odor: Sweet
Odor threshold: No data available
pH: Not applicable
Vapor pressure: Not determined
Vapor density: Not determined
Evaporation rate: No data available
Density: 1.24 g/cc
Decomposition temperature: 482F (250C)
Melting point/range: Not determined
Water solubility: Insoluble
Solubility in other solvents: None known

10. STABILITY AND REACTIVITY

Stability: Stable under recommended storage conditions

Conditions to avoid: Temperatures above 446F (230 °C).

Materials to avoid: Oxidizing agents. Strong bases.

Hazardous decomposition products: Burning produces obnoxious and toxic fumes. Aldehydes. Carbon monoxide (CO). carbon dioxide (CO_2).

Polymerization: Not applicable

11. TOXICOLOGICAL INFORMATION

Principle Routes of Exposure: Eye contact. Skin contact. Inhalation. Ingestion.

Acute toxicity: There were no target organ effects noted following ingestion or dermal exposure in animal studies.

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11. TOXICOLOGICAL INFORMATION

Local effects: May cause eye/skin irritation. Product dust may be irritating to eyes, skin and respiratory system. Caused mild to moderate conjuctival irritation in eye irritation studies using rabbits. Caused very mild redness in dermal irritation studies using rabbits (slightly irritating). Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

Long term toxicity: Did not cause skin allergic reactions in skin sensitization studies using guinea pigs.

Specific effects: May cause skin irritation and/or dermatitis. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough. Burning produces irritant fumes.

Mutagenic effects: No data is available on the product itself.

Reproductive toxicity: No data is available on the product itself.

Carcinogenic effects: No data is available on the product itself.

Target organ effects: There were no target organ effects noted following ingestion or dermal exposure in animal studies.

Skin: LD50/dermal/rabbit > 2000 mg/kg

Ingestion: LD50/oral/rat > 5000 mg/kg.

Further information: No information available

12. ECOLOGICAL INFORMATION

Mobility: No data available

Bioaccumulation: Does not bioaccumulate. Inherently biodegradable.

Ecotoxicity effects: EC50/72h/algae > 1100 mg/L

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12. ECOLOGICAL INFORMATION

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products: In accordance with local and national regulations. Do not contaminate ponds, waterways or ditches with chemical or used container. Contact manufacturer.

THE COMPANY HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION 3 (Composition/Information On Ingredients).

Contaminated packaging: Empty remaining contents. Do not re-use empty containers. Empty containers should be transported/delivered using a registered waste carrier to local recyclers for disposal.

14. TRANSPORT INFORMATION

U.S. Department of Transportation (DOT):
- **Proper shipping name:** None
- **Hazard class:** Not regulated.
- **UN-No:** None
- **Packing group:** None
- **Hazardous substances (RQ):** None

IMDG:
- **Proper shipping name:** None
- **Hazard class:** Not regulated.
- **UN/Id No.:** None
- **Packing group:** None

ICAO/IATA:
- **Proper shipping name:** None
- **Hazard Class:** Not regulated.
- **UN-No.:** None
- **Packing group:** None

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15. REGULATORY INFORMATION

(Not meant to be all inclusive--selected regulations represented)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

U.S. REGULATIONS

Sara 313 title III: Not Listed

TSCA Inventory List - Listed

STATE REGULATIONS

Proposition 65 listed material: Not Listed

INTERNATIONAL INVENTORIES

Canada DSL Inventory List : Listed
EU EINECS List : The components of this product listed in Section 3 are listed.
Japan (ECL) : Listed
Australia (AICS): Contact NatureWorks LLC for additional information.
Korean chemical inventory: Listed
Phillipines (PICCS) inventory: Not Listed
China inventory of existing chemical substances list : Listed

16. OTHER INFORMATION

Label information: NatureWorks® Polylactide Resin
Product code: 4032D

Reason for revision: Not applicable

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16. OTHER INFORMATION

Revision date: 07/19/2006
Print date: 02/27/2008

Recommended restrictions: None
Prepared by: NatureWorks LLC Health and Safety

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